CLAIMS

What is claimed is:

1. A method, comprising:

providing a usage monitoring heating ventilation and air conditioning control system, the usage monitoring heating ventilation and air conditioning control system including a programmable digital thermostat with an on board memory;

issuing personal identification numbers to each of a plurality of system users;

associating each of the plurality of system users with at least one of a plurality of user types;

storing the personal identification numbers in a first data structure in the on board memory; and

linking each one of a plurality of entries in the first data structure by reference to at least one of a plurality of entries in a second data structure in the on board memory, the second data structure including a list of user types.

2. The method of claim 1, wherein each of the plurality of user types is associated with at least one of a plurality of function sets.

3. The method of claim 1, wherein the on board memory can include a member selected from the group consisting of electrically erasable programmable read only memory, flash memory, random access memory, and network storage devices.

4. The method of claim 1, further comprising:

dynamically updating the first data structure; and

dynamically updating the second data structure.

5. A method, comprising:

receiving a request for an additional period of heating ventilation and air conditioning

system services from a requesting system user, the requesting system user composing a plurality of system users;

maintaining a data structure in an on board memory of a programmable thermostat, the data structure including a list of time entries, each time entry associated with one of the plurality of system users; and

updating the data structure by adding a duration in units of time to the time associated with the requesting system user.

6. The method of claim 5, wherein the time entry associated with the requesting user is updated dynamically in real time.

7. The method of claim 5, wherein the on board memory can include a member selected from the group consisting of electrically erasable programmable read only memory, flash memory, random access memory, and network storage devices.

8. The method of claim 5, further comprising reformatting the data structure to a spreadsheet format that is compatible with software on the central billing computer.

9. The method of claim 5, further comprising uploading the data structure to a central billing computer.

10. The method of claim 5, further comprising satisfying the request for the additional period of heating ventilation and air conditioning system services.

11. The method of claim 5, wherein the data structure includes a first segment associated with personal identification numbers and a second segment associated with time entries.

12. An apparatus, comprising:

a microcontroller;

a digital temperature sensor coupled to the microcontroller;

a liquid crystal display coupled to the microcontroller;

a set of cursor buttons coupled to the microcontroller;

an electrically erasable programmable read-only memory coupled to the microcontroller;

an upload capable connector coupled to the electronically erasable programmable read-only memory;

a real time clock coupled to the microcontroller; and

a back up power supply coupled to the real time clock.

13. The apparatus of claim 12, wherein the electrically erasable programmable read-only memory includes a first data structure, the first data structure including a list of personal identification numbers.

14. The apparatus of claim 13, wherein the first data structure includes a member selected from the group consisting of singly linked lists, hashes, arrays, sorted arrays, binary trees, stacks, heaps, queues, dequeues, doubly linked lists, tables, and circular linked lists.

15. The apparatus of claim 13, wherein the electrically erasable programmable read-only memory includes a second data structure, the second data structure including a list of time entries, each time entry associated with a personal identification number.

16. The apparatus of claim 15, wherein the second data structure includes a member selected from the group consisting of singly linked lists, hashes, arrays, sorted arrays, binary trees, stacks, heaps, queues, dequeues, doubly linked lists, tables, and circular linked lists.

17. The apparatus of claim 15, wherein the electrically erasable programmable read-only memory includes a third data structure, the third data structure including a calendar.

18. The apparatus of claim 17, wherein the third data structure includes a member selected from the group consisting of singly linked lists, hashes, tables, arrays, sorted arrays, binary

trees, stacks, heaps, queues, dequeues, doubly linked lists, and circular linked lists.

19. The apparatus of claim 17, wherein the electrically erasable programmable read only memory includes a fourth data structure, the fourth data structure including a list of user types.

20. The apparatus of claim 19, wherein the fourth data structure includes a member selected from the group consisting of singly linked lists, hashes, arrays, sorted arrays, binary trees, stacks, heaps, queues, dequeues, doubly linked lists, tables, and circular linked lists.

21. The apparatus of claim 12, further comprising a wireless interface coupled to the upload capable connector.

22. The apparatus of claim 21, further comprising a transceiver coupled to the wireless interface.

23. The apparatus of claim 22, further comprising a repeater coupled to the transceiver.

24. The apparatus of claim 12, further comprising a serial interface, coupled to the upload capable connector.

25. The apparatus of claim 24, further comprising a hand held personal data assistant coupled to the serial interface.

26. The apparatus of claim 12, further comprising an auxiliary memory coupled to the microcontroller and the electrically erasable programmable read-only memory.

27. The apparatus of claim 12, further comprising heating ventilation and air conditioning equipment coupled to the microcontroller.

28. A method, comprising regulating user access to an interactive user interface of a

programmable thermostat, each user identified by a personal identification number associated with a user type selected from the group consisting of building owners, maintenance personnel, building tenants, and manufacturers.

29. The method of claim 28, wherein each user's personal identification number belongs to exactly one user type.

30. The method of claim 28, wherein access to the interactive user interface is regulated using at least one of a plurality of software filters.